

REMARKS

Reconsideration of the application is requested.

Claims 1-12 remain in the application. Claims 1-8 are subject to examination and claims 9-12 have been withdrawn from examination.

Under the heading "Claim Rejections - 35 USC § 102" on pages 2-4 of the above-identified Office Action, claims 1-2 and 5-8 have been rejected as being fully anticipated by U.S. Patent No. 6,094,305 to Shiraishi (hereinafter Shiraishi) under 35 U.S.C. § 102.

As will be explained below, it is believed that the claims were patentable over the cited art in their original form and, therefore, the claims have not been amended to overcome the references.

The invention of the instant application relates to a method for characterizing an illumination source in an exposure apparatus. A mask dedicated for performing the characterization is introduced in the exposure apparatus. More specifically, the mask is introduced into a mask mount of the exposure apparatus. Thereby, the mask has a front side surface provided with an opaque layer, and a rear side surface for exposing such as exposing a transparent mask substrate.

The mask is introduced to the mask mount such that its front side including the opaque layer faces the illumination source.

The front side is then illuminated. A double slit configuration arranged in the front side produces an interference pattern that is imaged onto the transparent rear side surface of the mask. The image is transferred with considerable contrast ("sharp image") through the objective lens into the substrate (wafer) plane. The image profile resulting in the substrate plane is analyzed to obtain a light distribution representative of the illumination source width and extent (see further page 8, lines 19-25 of the specification of the instant application).

Shiraishi also teaches shows an exposure method and a projection exposure apparatus. Figs. 1 and 5 show a reticle 11 having a pattern 12 with reticle bare surface portions 12a and phase shift transmission portions. There is no opaque layer providing features of a slit, or double slit (see column 9, lines 55-64).

Still further and even more important, Figs. 1 and 5 of Shiraishi show that the mask has the phase shift pattern oriented towards an objective lens 13 and a substrate plane 14. In other words, the pattern does not face the illumination source like the invention of the instant

application. As a result, an interference pattern of the phase shift pattern cannot be formed on the mask rear side. Further, this interference pattern cannot be transferred sharply from the mask into the substrate plane. This is because the phase shift pattern 12 itself and not the interference pattern of the phase shift pattern 12 is in focus with the substrate plane as illustrated by the beams Do, Dp in Fig. 5.

Claim 1 of the instant application clearly recites:

providing a mask with a first side, on which an opaque layer is disposed, and an opposite second side having a surface, at least two mutually parallel slits separated from one another by a distance being disposed in the opaque layer; and

introducing the mask into the mask mount with the first side having the opaque layer facing the illumination source.

Consequently, Shiraishi does not teach each and every feature recited in claim 1 of the invention.

Under the heading "Claim Rejections - 35 USC § 103" on pages 4-5 of the above-identified Office Action, claims 3 and 4 have been rejected as being obvious over Shiraichi in view of U.S. Patent No. 4,885,232 to Spak (hereinafter Spak) or in view of U.S. Patent No. 6,699,628 to Shima (hereinafter Shima) under 35 U.S.C. § 103.

As Shima and Spak also fail to show the feature of the mask being reversed in the mask mount, the subject matter according to the invention is considered being new and inventive over Shima and Spak as recited in claim 1 of the instant application.

It is accordingly believed to be clear that none of the references, whether taken alone or in any combination, either show or suggest the features of claim 1. Claim 1 is, therefore, believed to be patentable over the art. The dependent claims are believed to be patentable as well because they all are ultimately dependent on claim 1.

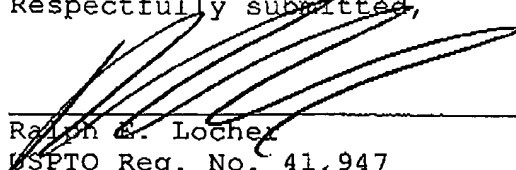
In view of the foregoing, reconsideration and allowance of claims 1-12 are solicited.

If an extension of time is required, petition for extension is herewith made. Any extension fee associated therewith should be charged to the Deposit Account of Lerner Greenberg Stemer, LLP, No. 12-1099.

Please charge any other fees that might be due with respect to Sections 1.16 and 1.17 to the Deposit Account of Lerner

Greenberg Stemer, LLP, No. 12-1099.

Respectfully submitted,



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